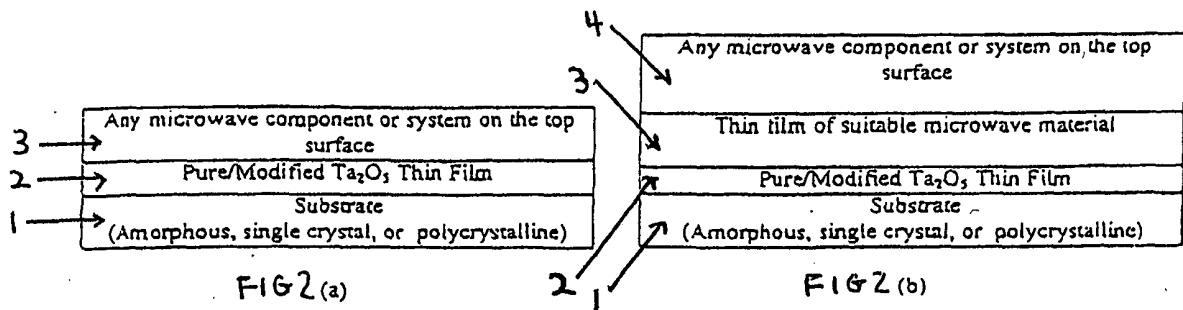


Fig. 1. Flow diagram for the fabrication of pure and modified Ta_2O_5 thin films by the chemical precursor solution technique using alkoxide-salt precursor solution prepared under room temperature conditions.



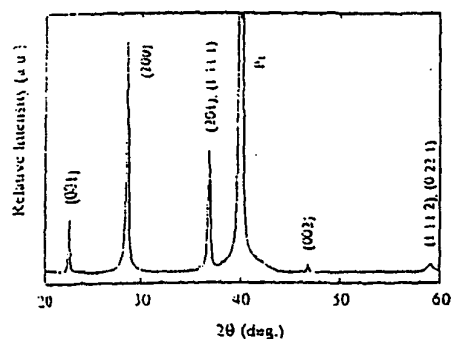


Fig. 3. X-ray diffraction patterns of Ta_2O_5 thin films annealed at 750 °C.

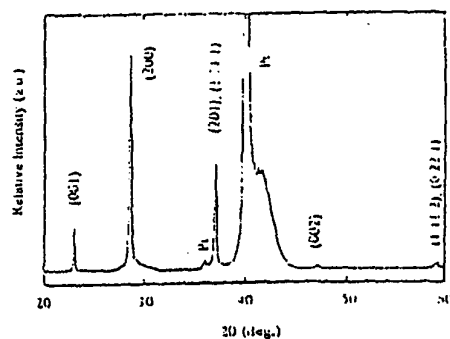


Fig. 4. X-ray diffraction patterns of $0.9\text{Ta}_2\text{O}_5-0.1\text{Al}_2\text{O}_3$ thin films annealed at 750 °C.

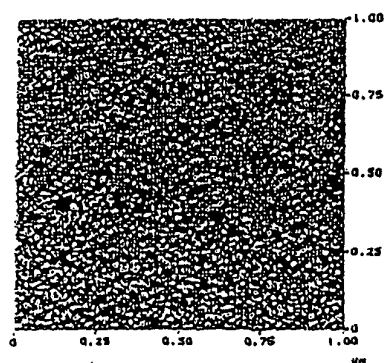


Fig. 5. AFM photograph of $0.9\text{Ta}_2\text{O}_5-0.1\text{Al}_2\text{O}_3$ thin films annealed at 750 °C.

0.9Ta ₂ O ₅ -0.1Al ₂ O ₃ Thin Films	
Dielectric Constant	42.8
Dissipation Factor	0.005
Charge Storage Density	18.9 fC/μm ² (at 0.5 MV/cm)
Leakage Current	< 10 ⁻⁹ A/cm ² (at 0.5 MV/cm)
Density	
Temperature Coefficient of Capacitance	-20 ppm/°C (range 25-125 °C)
Bias Stability of Capacitance	0.4% (up to 1 MV/cm)

Fig 6.

Table I. Enhanced dielectric and insulating properties of $0.9\text{Ta}_2\text{O}_5-0.1\text{Al}_2\text{O}_3$ thin films annealed at 750 °C.